

Vermont Transco, LLC

eEnergy Vermont

Abstract

The Vermont Transco eEnergy Project involves a collaboration of 20 publicly owned and investor-owned utilities in Vermont as well as the statewide energy efficiency utility, Efficiency Vermont. The project deploys advanced metering infrastructure (AMI), including approximately 300,000 smart meters across the state over 3 years and provides two-way communication between customers and the utilities. The project includes assessment of time-of-use and peak-time rebate programs through statistically rigorous consumer behavior studies that involve consumer Web portals and in-home displays. The project also involves installation of automated voltage regulators and supervisory control and data acquisition (SCADA) equipment at selected substations, enabling better management of the distribution system and reducing operations and maintenance costs.

Smart Grid Features

Communications infrastructure includes more than 1,100 miles of fiber optic connections between more than 290 substations, installed and privately funded by Vermont Electric Power Company (VELCO). Vermont's topography presents challenges in ensuring communications to meters. The eEnergy Vermont team will evaluate and select communications strategies for meter communication that consider the topography and needs of each individual utility.

Advanced metering infrastructure includes deployment of approximately 300,000 smart meters covering nearly 85% of all Vermont customers. The meters allow the utilities and their customers to view real-time usage and power quality. The goal of the AMI deployment is to give customers the tools necessary to lower their electricity usage and subsequently lower the utility's peak load.

Advanced electricity service options include home area networks for 500 customers. In addition, the customer access to Web portal access provides customers with information about their consumption, rate comparison tools, and features of social

At-A-Glance

Recipient: Vermont Transco

State: Vermont

NERC Region: Northeast Power Coordinating Council

Total Budget: \$137,857,302

Federal Share: \$68,928,650

Key Partners: Burlington Electric Department, Central Vermont Public Service, Green Mountain Power Corp., Group of Municipal Electric Utilities, Vermont Electric Cooperative, Vermont Transco LLC, Vermont Energy Investment Corporation, Washington Electric Cooperative

Project Type: Integrated and/or Crosscutting Systems

Equipment

- 311,380 Smart Meters
- AMI Communication Systems
 - Meter Communications Network
 - Backhaul Communications
- Meter Data Management System
- Customer Web Portal
- 500 Home Area Networks
- Distribution Automation Equipment for up to 47 out of 484 Circuits
 - Distribution Management System
 - Distribution Automation Communications Network
 - SCADA Communications Network
 - Automated Distribution Circuit Switches
 - Automated Regulators
 - Circuit Monitors/Indicators

Time-based Rate Programs Targeting up to 1,500

Customers

- Time of Use
- Peak-Time Rebate

Key Targeted Benefits

- Reduced Electricity Costs for Customers
- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Reduced Costs from Equipment Failures and Theft
- Deferred investment in Distribution Capacity Expansion
- Reduced Greenhouse Gas and Criteria Pollutant Emissions

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networking, facilitating two-way information feedback. These advanced electric service options provide customers with new capabilities to control and reduce their electricity costs.

Distribution automation systems include distribution line circuit breakers, fault indicators, circuit metering, and voltage regulators, which are used to automate up to 47 circuits. This upgrade increases operational efficiency of the Vermont distribution system while lowering operations and maintenance costs. SCADA remote terminal units installed at several substations expand the SCADA network and include an outage management system to reduce outage restoration time by making it easier to locate faults.

Time-based rate programs include time-of-use rates and peak-time rebates. Time-of-use rates are already offered to most Vermont consumers, but the new smart meters enable a variety of new types of rate offerings. The aim is to provide financial incentives for consumers to shift the timing of daily usage from peak to off-peak periods. Through time-based rate programs, consumers can take control of their electricity consumption and bills and reduce the amount of electric capacity the local utility needs to provide.

Consumer Behavior Study

Vermont Transco will perform a statistically rigorous assessment of the relative merits of several time-based rate program options and information treatments on a subset of residential customers in Vermont. This is a randomized study involving both treatment groups and control groups. The options include (1) opt-in variable-peak pricing, (2) opt-out flat pricing with peak-time rebates for critical events, and (3) opt-in flat pricing with critical peak-price events. Information treatments include a Web portal, in-home displays, and appliance controls. The study explores how consumers respond to these pricing options and information treatments, with the final goal of estimating the impacts on total electricity use and hourly load profiles using information collected through advanced meters. This study also compares transition effects for two groups of customers: those who transition from flat pricing to critical peak pricing, and those who transition from peak-time rebates to critical peak pricing.

Timeline

Key Milestones	Target Dates
AMI asset deployment begins	Q3 2010
Distribution automation asset deployment begins	Q2 2011
AMI and distribution automation asset deployment ends	Q2 2013

Contact Information

Allen Stamp
Project Manager
Vermont Transco
astamp@velco.com

Recipient Team Project Web Site: www.velco.com/Projects/smartgrid/Pages/components.aspx